

What is Claimed is:

1. An apparatus, comprising:

a fixed component and a movable component disposed in sliding engagement with one another;

5 a means for providing a force between the fixed component and the movable component.

2. The apparatus of claim 1, wherein the means for providing the force between the fixed component and the movable component comprises a spring and a means for deflecting the spring as the fixed component and the moveable component are moved relative to one another.

3. The apparatus of claim 2, wherein the spring provides an ascending spring force  
10 as the deflection of the spring increases.

4. The apparatus of claim 3, further comprising a means for converting the ascending force of the spring to a substantially constant counter-balancing force.

5. The apparatus of claim 1, wherein the means for providing the force between the fixed component and the movable component comprises a constant force spring.

15 6. An apparatus, comprising:

a first component and a second component disposed in sliding engagement with one another;

a means for providing a balancing force between the first component and the second component;

20 a magnitude of the balancing force being substantially equal to a first load;

a means for providing a friction force for resisting relative movement between the first component and the second component;

the friction force having a magnitude smaller than the magnitude of the balancing force.

7. The apparatus of claim 6, wherein a combination of the balancing force and the friction force is capable of supporting a second load that is larger than the first load.

8. The apparatus of claim 7, wherein the first load is a weight of a first display.

9. The apparatus of claim 8, wherein the second load is a weight of a second display.

5 10. The apparatus of claim 9, wherein a magnitude of the friction force is similar to an expected maximum variation between the weight of the first display and the weight of the second display.

11. The apparatus of claim 10, wherein a magnitude of the friction force is similar to an expected maximum variation in the weight of the display due to manufacturing tolerances.

10 12. The apparatus of claim 6, wherein the friction force is sufficiently large to prevent relative movement between the first component and the second component while the apparatus is supporting a third load which is smaller than the first load.

13. The apparatus of claim 6, further including at least one slide for guiding relative motion between the first component and the second component.

15 14. The apparatus of claim 13, wherein the first component and the second component are free of any mechanical interlocking preventing motion parallel to an axis of the at least one slide so that the first component and the second component may be moved relative to one another by applying a single repositioning force which overcomes the friction force.

15. The apparatus of claim 6, wherein the magnitude of the friction force is smaller  
20 than a force created by a single human hand.

16. The apparatus of claim 6, wherein the magnitude of the friction force is smaller than a force created by a single human finger.

17. The apparatus of claim 6, wherein the means for providing the balancing force comprises a spring and the magnitude of the friction force is sufficiently large to prevent relative movement between the first component and the second component when a characteristic of the spring varies over time.

5 18. The apparatus of claim 6, wherein the means for providing the balancing force includes a spring and the magnitude of the friction force is sufficiently large to prevent relative movement between the first component and the second component when a material of the spring creeps over time.

10 19. The apparatus of claim 6, wherein the means for providing the balancing force includes a spring and the magnitude of the friction force is sufficiently large to prevent relative movement between the first component and the second component due to a variation in a spring constant of the spring over the travel of the first component relative to the second component.

20. The apparatus of claim 19, wherein the pre-determined variation in the spring constant of the spring is a variation due to a predicted non-linearity in the spring constant.

15 21. The apparatus of claim 6, wherein the means for providing the balancing force comprises a constant force spring and the means for providing the friction force comprises a shoe contacting an outer surface of the constant force spring.

20 22. The apparatus of claim 6, wherein the means for providing the balancing force comprises a cam and the means for providing the friction force comprises a shoe contacting an outer surface of the cam.

23. The apparatus of claim 6, wherein the friction force is a static friction force.

24. An apparatus, comprising:  
a cam having a first cam surface;

a spring assembly including a roller and a shoe;  
the roller contacting the first cam surface at a rolling contact point;  
the shoe contacting the first cam surface at a sliding contact point;  
friction at the sliding contact point producing a friction force resisting relative movement  
5 between the head and the base.

25. The apparatus of claim 24, wherein:  
the roller is arranged to rotate about an axle of the spring assembly;  
the shoe is pivotally coupled to the axle with a resilient member interposed between the  
shoe and the axle;  
10 a portion of the shoe extending beyond the roller by a predetermined distance when the  
resilient member assumes a resting shape;  
the resilient member being reversibly deformable so that the shoe is biased against the  
first cam surface at the sliding contact point while the roller is contacting the first cam surface at  
the rolling contact point.

15 26. The apparatus of claim 24, wherein a diameter of the roller and an extent of the  
shoe are selected to prevent deformation of the resilient member beyond a pre-determined limit.

27. The apparatus of claim 24, wherein a diameter of the roller and an extent of the  
shoe are selected to provide a desired deformation distance.

28. The apparatus of claim 27, wherein the deformation distance and a material  
20 characteristic of the resilient member are selected to provide a pre-determined bias force.

29. The apparatus of claim 28, wherein the predetermined bias force is selected to  
provide a desired friction force.

30. The apparatus of claim 24, wherein the roller and the cam act upon one another at the rolling contact point to produce a balancing force between the head and the base.

31. The apparatus of claim 30, wherein a magnitude of the balancing force is substantially equal to a first load.

5 32. The apparatus of claim 31, wherein a combination of the balancing force and the friction force is capable of supporting a second load that is larger than the first load.

33. The apparatus of claim 31, wherein the friction force is sufficiently large to prevent relative movement between the head and the base when the apparatus is supporting a third load which is smaller than the first load.

10 34. The apparatus of claim 24, wherein:

the roller is arranged to rotate about an axle of the spring assembly;

the shoe is pivotally coupled to the axle with a resilient member interposed between the shoe and the axle;

a distal portion of the shoe extending beyond an outer periphery of the roller while the  
15 resilient member is in a relaxed state;

the resilient member being sufficiently deformable to allow the shoe to assume a retracted position in which a distal surface of the distal portion of the shoe is aligned with the outer periphery of the roller.

35. A method of supporting a load comprising the steps of:

20 providing an apparatus comprising a cam, a roller arranged to rotate about an axle, and a shoe pivotally coupled to the axle with a resilient member interposed between the shoe and the axle, wherein a portion of the shoe extending beyond the roller by a predetermined distance when the resilient member assumes a resting shape; and

urging the shoe against a first cam surface of the cam and deforming the resilient member so that the shoe is biased against the first cam surface at a sliding contact point while the roller is contacting the first cam surface at a rolling contact point.

36. The apparatus of claim 35, wherein a diameter of the roller and an extent of the shoe are selected to prevent deformation of the sleeve beyond a pre-determined limit.

37. The apparatus of claim 35, wherein a diameter of the roller and an extent of the shoe are selected to provide a desired deformation distance.

38. The apparatus of claim 35, wherein the roller and the shoe are both urged against the cam surface of the cam by a spring.

39. The apparatus of claim 38, wherein the deformation distance and a material characteristic of the resilient member are selected to provide a pre-determined bias force.

40. The apparatus of claim 39, wherein the predetermined bias force is selected to provide a desired friction force.

41. An apparatus, comprising:  
a first slide comprising a first inner rail and a first outer rail;  
a spring assembly coupled between the inner rail and the outer rail; and  
the spring assembly being disposed between the first slide and a second slide.

42. The apparatus of claim 41, wherein the balance mechanism is disposed within a projection defined by the first slide.

43. An apparatus, comprising:  
a first slide comprising a first inner rail and a first outer rail;  
a constant force spring having a distal end fixed to one of the rails;  
a shoe fixed to the other of the rails;

the shoe contacting a coiled portion of the constant force spring for providing a balancing force between the first inner rail and a first outer rail.